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The

Monthly Evening Sky Map

A JOURNAL FOR THE AMATEUR — FOUNDED BY THE LATE LEON BA[illegible]
—NORTHERN AND SOUTHERN HEMISPHERE—
ALSO A STAR, CONSTELLATION AND PLANET FINDER
ARRANGED FOR THE CURRENT MONTHS —JAN. - FEB. - M[illegible]
MORNING AND EVENING — AND PRACTICAL ANYWHER[illegible] IN
THE WORLD PUBLISHED QUART[illegible]Y

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EVENING SKY MAP FOR JANUARY

Face South And Hold The Map Overhead. The Top North And You Will See The Stars And Planets Just As They Appear In The Heavens. The Arrow Through The Two Stars In The Bowl Of The Big Dipper Points To The North Star, The Star At The End Of The Little Dipper.

AT 9:00 P. M., JAN. 1; 8:00 P. M., JAN. 15; 7:00 P. M., JAN. 30.

This map is arranged specifically for Latitude 40 North—New York—but is practical for ten or fifteen degrees north or south of this latitude anywhere in the United States, the southern portion of Canada and the northern portion of Mexico and for corresponding latitude in Europe.

USE FOR AMATEUR TELESCOPES

December to February

One who has made his own telescope has many opportunities to observe the wonders and curiosities of the sky, but everyone can learn much of many of these objects. Celestial objects visible to the naked eye or with a pair of field glasses can be studied and enjoyed under the aid of a telescope. Then beyond the naked eye objects are the details of the Hyades and the Pleiades, and the many beauty spots of the Milky Way. These beauty spots, which include the galactic star clusters, globular star clusters, diffuse and planetary nebulae, thrill the observer no matter how many times he finds them in the field of vision. But when he has enjoyed these wonders of our galaxy—the Milky Way system of stars—he has just begun to reach out into space. The most distant objects in our galaxy visible in an amateur telescope is NGC (New General Catalogue) No. 7006 (Right Ascension 20h 57 min, Declination 15° 48'—North) a globular cluster, magnitude 11. , easily visible in a 6-inch telescope on a clear, dark night. Its distance, as given in Harlow Shapley's book, "Star Clusters," is 56.8 kiloparsecs, which means 185.11 light years. This distance may be too great due to the recently discovered galactic obscurations of cosmic dust or drifting nebulosity.

But far beyond our galaxy are other galaxies and clusters of galaxies to stagger the imagination. The most distant of these extragalitic objects so far observed—not visually but photographically is "of the order of 500 million light years." Galaxies of this tremendous distance are shown in a photograph in "The Realm of the Nebulae," by Edwin Hubble. The author indicates only one of these on the plate, but it is easy to pick out at least a dozen others. Looking the same distance in the opposite direction from which this picture was taken gives the observable universe the stupendous expanse of a billion light years. And this is probably only a step into limitless space.

A galaxy is an organized aggregation of stars held together by gravitational attraction. The stars of the group revolve around a central nucleus, and the centrifugal force of this revolution increases the group's equatorial diameter and this, of course, decreases the axial diameter. The result is that most galaxies are shaped like an old-time wagon wheel with a large hub. (Our galaxy's equatorial diameter is about 200,00 light years and its axis about 40,000 light years.) The revolving movement of these objects has given them the name "spiral galaxies." But all galaxies are not spirals. There are spheroidal and irregular galaxies, like NGC 205 listed below, the Magellanic Clouds, NGC 6822, etc.

Our galaxy is a triple system, the companions being the two Magellanic Clouds. NGC 224 (see list) has two companions, NGC 221 and 205. NGC 5194(M. 51, (13h 27m, 47° 30'—N.), the "Whirlpool Nebula," the first galaxy discovered to be a spiral has one companion. Just how many other galaxies are organized in groups will never be known because of their great distances. Also some galaxies may be composed of more than four systems.

Galaxies are thought to be separated by about one million light years. When in clusters their distances are perhaps somewhat less, though the clusters are separated by greater ditances. In our own cluster NGC 6822 (19h 42m 14° 53'—S.) is only 625,00 light years from the sun. NGC 598 is 770,000 light years and NGC 224 is 805,000 light years. Another "nearby" galaxy is NGC 221 (00h 40m 40° 36'—N.). This is Messier 32, and is 700,000 light years distant.

Galaxies in outer space are assumed to be of uniform intrinsic brightness. Therefore apparent faintness indicates greater distance. Only within the last thirty or forty years has the distance of even the nearest of these objects been known. In fact, not until 100-inch telescope showed that the brighter "nebulae" were systems of stars floating through space far beyond the Milky Way system, was much progress made in estimating the distance of these outer "Milky Way."

There are fifteen or twenty known clusters or galaxies, but in most of observable space galaxies seems to be uniformly distributed. The greatest clustering of these systems is in the constellations Coma Berenices, Virgo, and nearby regions.

There are some 230 galaxies brighter than the thirteenth magnitude north of the celestial equator, in the twelfth hour ofR Right Ascension. Most of these are estimated to be of the order of 7,000,000 to 10,000,000 light years—the fainter ones being more remote.

Galaxies are found in all regions of space—hundreds of millions of them—except near the Milky Way. This does not mean that there are none in this direction, but merely that we cannot see them through the masses of stars of the Milky Way and the obscuring material on either side of it. In every direction in our sample of space—a globe of space 1,000 million light years in diameter—there are about 100 million systems of stars like our own Milky Way system, and they seem to be of comparable size and population.

By visual observation nearly all galaxies look like small clouds of nebulosity. For this reason early astronomers thought that they were clouds of nebulous material, so they called them "Nebulae." This name was also applied to distant globular star clusters and to diffuse and planetary nebulae. When photography came to the aid of astronomers all these objects, except the galaxies were found to be in our own galaxy. Nebulae are only a very small part of a galaxy. So astronomers began calling them by their right name—"galaxies."

With amateur telescopes a number of galaxies can be observed and some estimates made of their distances. At this time of the year—December to February—some notable galaxies may be observed. Here are a few of those I have seen in this region of the sky:

205 *Andromeda.* 00h 38m 41° 25'—N. b 10.8, diameter 8'.0 x 3'.0, Spheriodal, nearly edgewise. It is a hazy patch near M 31. Use low power.

224 (*M.* 31). 0040 4100—N. m 5, dia 160'.0 x 40'.0. "The Great Galaxy in Andromeda." Rotates in about 19 million years. Distance 805,000 light years.

247 *Cetus* 0044 2101—S. m 10.7, dia 18'.0 x 5'.0. Spiral seen edgewise.

253 (*H. V.* 1). *Sculptor.* 0045 2534—S. m 7.0, dia. 22'.0 x 6'.0. Very bright. It extends entirely across the field of my telescope in 135 power.

598 (*M.* 33). *Triangulum.* 0131 3024—N. m 7.8, dia. 60'.0 x 40'.0. Spiral seen nearly broadside. Nearest of the spirals, except M. 32 referred to above. Distance 770,000 light years.

613 (*H. I.* 281). *Sculptor.* 0132 2940—S. m 11.1, dia. 4'.0 x 2'.0. Barred spiral seen nearly edgewise. Bright and interesting.

628 (*M.* 74). *Pisces.* 0134 1532—N. m. 11.2, dia. 8'.0 x 8'.0. Spiral seen exactly broadside.

1300 *Eridanus.* 0317 1235—S. m 11.8, dia 6'0. x 3'.0. Barred spiral inclined about 50 percent from broadside.

There are a few other bright galaxies farther north, but my telescope does not reach north of 45° so I do not list them. Also, in the region covered by the above list are many galactic star clusters, a few globular clusters, planetaries and diffuse nebulae.

—J. B. DURYEA

THE STARS AND CONSTELLATIONS FOR MARCH

Orion, with his great cortege of brilliant constellations, is now rapidly declining in the west. This is the last month in which the greatest of the constellations appears dominant in the sky, Sirius, too, is fast approaching the horizon in the southwest, where he sparkles like a magnificent diamond. Capella, high in the northwest, is very beautiful, lying at the edge of the Milky Way. Following the trend of the Milky Way toward the left from Capella, the eye is led in an almost due south direction to Procyon the first magnitude star in Canis Minor.

The Beehive cluster in Cancer is now close to the meridian, and well worth looking at even with an opera glass. Below Cancer is the diamond-shaped figure in the head of the long constellation Hydra, whose stream of small stars runs off to the eastern horizon, only the lone Alphard, attracting much attention. East of Cancer, and just on the ecliptic, is Regulus, the chief star of Leo, with the figure of the "Sickle" plainly marked by the five stars immediately above it. East of Leo appears Virgo, her principal star, the beautiful Spica, glittering with a pure white ray a little above the eastern horizon. As the night advances, all the stars move perceptibly westward, and Spica glows with increasing splendor as it rises higher out of the mists. South of a line drawn from Regulus to Spica will be seen the two small con-

(Continued on Page 3)

EVENING SKY MAP FOR FEBRUARY

March Stars and Constellations (Con'td.)

stellations of Crater and Corvus, the latter conspicious on account of the striking quadrilateral figure formed by its four chief stars.

In the northeast, higher than Spica, gleams the great Arcturus actually one of the largest of all suns and having a decided reddish tint when near the horizon, although its color fades as it approaches mid heaven. Below Arcturus, in the direction of Leo glitters the remarkable little constellation of Coma Berenices. Just risen far in the northeast is the almost complete circle of the Corona, or the Northern Crown. The figure of the "Big Dipper" in Ursa Major will attract all eyes. The two outer stars in the "Bowl" are known as "the Pointers" because a line drawn through them and extended northward nearly hits the North Star. The distance between the two stars known as the "Pointers" is roughly about five degrees, and may be taken as a sort of yardstick for measurements in the heavens. The distance from the other side of the Pole Star, opposite to the Great Dipper, and in the northwest, will be seen the beautiful constellation Cassiopeia, five of whose stars form an irregular figure like the letter "W" with its top toward the pole.

Possessors of small telescopes would do well to examine the middle star in the handle of the Great Dipper. This is Mizar, a celebrated double; the naked eye sees a very small star very close to it named Alcor. But the telescope will show that Mizar itself is double, presenting a very beautiful and to one who has never seen a double star, a startling sight. The two stars composing the double are of uneven size and of brilliantly contrasted colors. The larger one being white, and the smaller bright blue-green; the distance apart is about 14 seconds of arc. A three-inche telescope with a magnifying power of from 50 to 100 diameters will give an ecellent view of Mizar and its companion.

Another celebrated double star of a very different class, which may also be viewed with a three-inch telescope, using its highest power, is the Pole Star itself. This star has a very small dark blue companion, at a distance of about 19 seconds of arc.

It is interesting to remark that three great "Nautical Stars" are now visible and may be seen on the chart—Aldebaran in Taurus; Regulus in Leo, and Spica in Virgo. All lie near the ecliptic, and they are very useful to mariners who, by the aid of the tables in the "Nautical Almanac," can deduce from the Moon's measured distance from these stars the Greenwich time corresponding to the times of observation, and can thus determine their longitude at sea. Jupiter and other planets are also available for this purpose, but the great fixed stars near the ecliptic, being immovable are the best for the purpose. The close observer will be interested in the contrast of colors presented by the three stars above named. Aldebaran is decidely reddish. Regulus is pale yellow, and Spica is snow white. These differences of color are believed to indicate corresponding differences af age in stars, the red being the oldest and the white ones the youngest.

(March brings spring weather on earth and spring stars in the sky. The Winter Hexagon, which we described in detail last month, still takes up the western half of the heavens. But in the east we see less brilliant groups which we associate with warmer weather. To many of us, these unspectacular stars are more friendly than winter's brilliants. Your reporter has always had a special affection for Arcturus which returns to us again March evenings.

The most prominent of the new groups is the Big Dipper which has been hiding in the poor visibility of the horibon and now has made its way halfway up to the zenith. It is no far-fetched figure to compare this annual spring awakening to the end of the annual hibernation of a bear. The bear's forepaws, which must be added to the Dipper, to complete the constellation of Ursa Majojr, are now well placed for observation. They

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AMATEUR'S FORUM

By IRVING L. MEYER, M. S.

January, 1954

THE SUN: moves from Sagittarius into Capricornus, deep in the southern skies. The Earth is closest to the Sun the 2nd at a distance of 91.3 million miles.

On the 9th there is an annular eclipse of the Sun, but the area of visibility is confined to Antarctica and portions of the Indian Ocean and the South Pacific Ocean. The center of this eclipse passes within 3 or 4 degrees of the South Pole.

THE MOON: is at perigee—closest to the earth the 10th at a distance of 230,000 miles, and is at apogee—farthest from the earth the 26th at 251,000 miles.

The Moon's phases (E. S. T.):

New Moon	January	4 at	9:21 PM
First Quarter		11 at	7:22 PM
Full Moon		18 at	9:37 PM
Last Quarter		26 at	10:28 PM

There will be a total eclipse of the Moon the night of the 18th. This eclipse will be visible generally over Europe, Africa, the Atlantic Ocean, North and South America. The circumstance of the eclipse follow:

Moon enters penumbra	January	18 at	6:40 PM
Moon enters umbra		18 at	7:50 PM
Total eclipse begins		18 at	9:17 PM
Middle of eclipse		18 at	9:52 PM
Total eclipse ends		18 at	9:47 PM
Moon leaves umbra		18 at	11:19 PM
Moon leaves penumbra		19 at	12:24 AM

The magnitude of the eclipse is 1.037, where the Moon's diameter is 1.0.

MERCURY: is too close to the Sun all month to be observable. It is in the morning sky until superior conjunction with the Sun on the 14th, after which it is in the evening sky. Maximum distance from the earth on the 9th, is 133 million miles. It travels from Sagittarius into Capricornus.

VENUS like Mercury, is too close to the Sun all month to be observable. It is in the morning sky until superior conjunction on the 29th. Moving from Sagittarius into Capricornus, its distance increases from 157 to 159 million miles during the month.

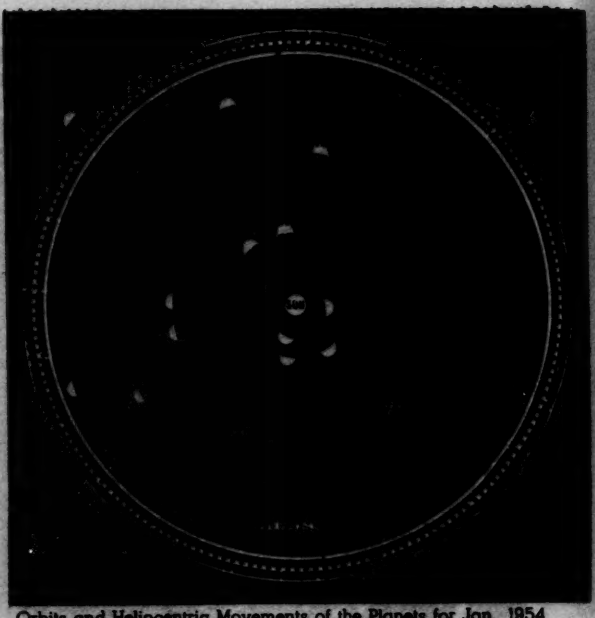
MARS: in the morning sky, moves from the Virgo-Libra boundary through Libra to a point close to the Scorpio boundary. It is a moderately bright object in the late morning sky, rising well after midnight. On the 2nd it is in conjunction with Saturn, and will be a little over a degree (two lunar diameters) south of that planet. Mars' magnitude then will be 1. 6, while Saturn's will be 0.8. Geocentric distance the 1st 170 million miles, and the 31st is 144 million miles.

JUPITER: northeast of Aldebaran, in Taurus, is well placed for observation in the evening sky. This mighty planet is just past opposition and shines at an average magnitude of 2.2 during the month. Distance the 15th of 398 million miles gives the planet an apparent diameter of 46", making its disc easily discernible with the smallest optical aid. The four brighter satellites are also easy to see even with binoculars.

SATURN: on the Virgo-Libra border in the morning sky, is becoming increasingly better placed for observation. At quadrature the end of the month, it rises at about midnight. Distance the 15th is 927 million miles, giving the ring system an apparent diameter of 38". They are readily detectable with small instruments, and are a truly astounding sight when seen through a moderate sized telescope with a power of 100 diameters and up.

URANUS: comes to opposition the 11th in Gemini, and is perfectly situated for observation, being above the horizon the entire night. This remote planet is of the sixth magnitude, but can be seen with the naked eye on a moonless night. Moderate magnification in the telescope reveals a neat, round disc. Minimum distance, the 12th, is 1646 million miles.

NEPTUNE: close to Spica in Virgo, is a morning sky object of magnitude 8, invisible to the naked eye. At quadrature the middle of the month, it then rises around midnight, and its distance from the earth is 2817 million miles. This planet is becoming better placed for observation.



Orbits and Heliocentric Movements of the Planets for Jan., 1954

PLANETARY CONFIGURATIONS

Eastern Standard Time

January, 1954

Jan. 1	10:— AM	Mercury in aphelion
Jan. 2	3:— AM	Earth in perihelion
Jan. 2	4:— PM	Conjunction, Mars and Saturn; Mars south 1° 17'
Jan. 4	4:— AM	Conjunction, Mercury and Venus; Mercury south 1° 2'
Jan. 4	9:27 AM	Conjunction, Venus and Moon; Venus north 1° 10'
Jan. 4	9:37 AM	Conjunction, Mercury and Moon; Mercury north 0° 7'
Jan. 4	— — —	Annular eclipse of the Sun
Jan. 11	2:— PM	Opposition, Uranus and Sun
Jan. 14	1:— PM	Superior conjuction, Mercury and Sun; Mercury south 1° 59'
Jan. 15	8:30 PM	Conjunction, Jupiter and Moon; Jupiter south 3° 34'
Jan. 16	12:— PM	Quadrature, Neptune and Sun
Jan. 18	7:29 AM	Conjunction, Uranus and Moon; Uranus north 0° 12'
Jan. 18	— — —	Total eclipse of the Moon
Jan. 21	6:— PM	Mercury greatest heliocentric latitude south
Jan. 26	6:34 AM	Conjunction, Neptune and Moon; Neptune north 7° 28'
Jan. 27	8:07 AM	Conjunction, Saturn and Moon; Saturn north 7° 53'
Jan. 28	12:— AM	Neptune stationary in Right Ascension
Jan. 28	10:03 AM	Conjunction, Mars and Moon; Mars north 5° 44'
Jan. 29	7:— AM	Quadraturt, Saturn and Sun
Jan. 29	7:— PM	Superior conjuction, Venus and Sun; Venus south 1° 9'
Jan. 30	4:— PM	Venus in aphelion

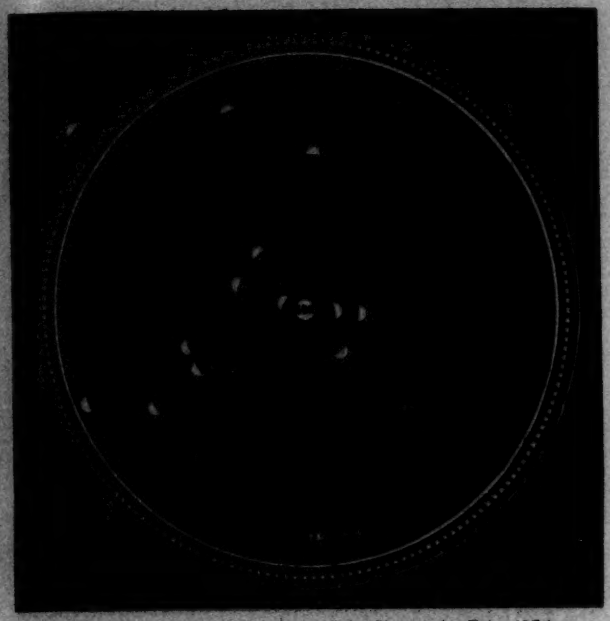
PLANETARY CONFIGURATIONS

Eastern Standard Time

February, 1954

Feb. 3	2:52 PM	Conjunction, Venus and Moon; Venus south 3° 27'
Feb. 4	4:00 PM	Conjunction, Mercury and Moon; Mercury south 4° 29'
Feb. 9	7:— PM	Mercury in ascending node
Feb. 10	7:— AM	Jupiter stationery in Right Ascension
Feb. 12	12:24 AM	Conjunction, Jupiter and Moon; Jupiter south 3° 30'
Feb. 12	6:— PM	Opposition, Pluto and Sun

(Continued on Page 5)



Orbits and Heliocentric Movements of the Planets for Feb., 1954

NOTE: The planets are shown in their respective orbits. Two positions, one for the first, and one for the last day of the month, are given for Mercury, Venus and Mars. The arrow indicates the last day of the month. Jupiter, Saturn, Uranus and Neptune are shown in the mean position for the current month.

Planetary Configurations (Con'td.)

Feb. 13 —	3:— PM	Mercury greatest elongation east, 18° 9'
Feb. 14 —	10:— AM	Mercury in perihelion
Feb. 14 —	12:23 PM	Conjunction, Uranus and Moon; Uranus north 0° 7'
Feb. 17 —	8:— PM	Saturn stationary in Right Ascension
Feb. 19 —	12:— PM	Mercury stationary in Right Ascension
Feb. 21 —	11:— PM	Venus greatest heliocentric latitude south
Feb. 22 —	1:47 PM	Conjunction, Neptune and Moon; Neptune north 7° 22'
Feb. 23 —	4:33 PM	Conjunction, Saturn and Moon; Saturn north 7° 51'
Feb. 24 —	4:— PM	Mercury greatest heliocentric latitude north
Feb. 24 —	9:— PM	Conjunction, Mercury and Venus; Mercury north 5° 21'
Feb. 25 —	11:53 PM	Conjunction, Mars and Moon; Mars north 4° 20'

AMATEUR'S FORUM

February, 1954

By IRVING L. MEYER, M. S.

THE SUN: moves northeastwardly from Capricornus into Aquarius. Distance the 1st is 91.5 million miles, and the 28th is 82.0 million miles.

THE MOON: is closest to the earth the 6th at 227,000 miles, and is farthest the 22nd at 252,000 miles.

The Moon's phases (E. S. T.):

New Moon	February 3 at	10:55 AM
First Quarter	10 at	3:29 AM
Full Moon	17 at	2:17 PM
Last Quarter	25 at	6:29 PM

MERCURY: travels from Capricornus into Aquarius, and is in the evening sky all month. It is at greatest elongation from the Sun, 18° 9' east, on the 13th, and for a few days before and after this date the planet can be picked out as a bright star in the twilight zone, shortly after sunset. Magnitude on the 13th is 0.2, and in the telescope its 7" diameter disc will look exactly like the Moon at quarter phase. Distance the 1st is 116 million miles, and the28th is 60 million miles.

VENUS in the evening sky, also moves from Capricornus into Aquarius, but is too close to the Sun for satisfactory observation. It is farther from the earth the 1st at 159 million miles.

MARS: is approaching the earth at a rapid pace. On the 1st it is 143 million miles away in Libra, and by the 28th it has moved to a point in Scorpio, close to Antares, at a distance of 118 million miles. Its diameter is 7" at the end of the month, appearing as a small reddish disc in the telescope. In the morning sky all month, it rises shortly after midnight.

JUPITER: In Taurus all month, in the evening sky, and sets after midnight. Well placed for observation, this brilliant planet is a rewarding sight as seen through the smallest telescopes, while a power of 100 diameters and up will reveal the cloud belts readily. Distance the 15th is 435 million miles.

SATURN: is entering Libra in the morning sky, rising shortly before midnight. It is the most striking planetary object as seen in the telescope, with a unique ring system and many satellites, some of which are observable with modest equipment. Distance the 15th is 879 million miles.

URANUS: rides high in the northern heavens in Gemini. It is well placed for observation, as it remains above the horizon most of the night. At magnitude 6 it can be seen with the unaided eye. Distance the middle of the month is 1662 million miles.

NEPTUNE: northeast of Spica, in Virgo, is approaching opposition, and rises well before midnight. However, this is a puny sight, visible only with optical aid (good binoculars will reveal it as a tiny pinpoint of light.) It is very remote—2769 million miles away the 15th.

PLUTO: This most distant known planet is in the sickle of Leo, and comes to opposition the 12th. At about this date it is closest to the earth—3187 million miles. Exceedingly faint, of the order of magnitude 14, only sizeable telescopes will reveal the planet at all. As seen by the writer through the great Clark refractor of the U. S. Naval Observatory in Washington, D. C., this planet was on the borderline of visibility.

March Stars and Constellations (Con'td.)

are marked on the chart by two triangles and a lone star. The region is rich in pairs and well worth exploring with naked ey or opera glass. Besides that, any full-fledged star-gazzer should feel ashamed to be unable to trace the full figure of this most important constellation in the sky. A familiarity with the region is especially necessary for those who would like to become amateur meteor plotters.

Nestled under the handle of the Dipper lies Cor Caroli and the handful of faint stars which marks the Hunting Dogs. One of these faint stars is unusually red and is also a variable. We may have more to say about it next month. Its color gave rise to its name: La Superba.

Bootes rises behind the Dipper and Arcturus may be located by following the curve of the handle. Watch the color changes in this star as it clears the horizon and as sky conditions vary from night to night. It seems to your reporter friendlier when low. Then it is burnished and burning. High up, it assumes the cold dignity of a pure golden glow.

In the southeast, Virgo is rising, but Spica has not yet appeared. Further south may be seen the smaller constellations, Corvus and Crater. Corvus is not well up on the chart, but it has cleared the horizon by nine o'clok at the end of the month. There is an old myth that the hare resents the call of the crow and makes a point of keeping out of his way. As a result Lepus does not rise until the Crow has set and when the Crow rises Lepus makes haste to set. According to the myth, the two are never seen in the sky together but this is not true. It is possible to see thm both at nine P. M. around March 11 or at eight P. M. at the end of the month Lepus is so low that con ditions must be good for one to make him out. Even before he has actually set, his stars shrink out of sight in the mists of the horizon.

There is a parallel myth about Orion and Scorpio, which is more accurate . If you recall the classical story, you will remember that Orion was a powerful giant who offended everyone by his vanity. Juno sent a scorpion to humble him. The tiny scorpion felled the giant by stinging his heel but not before that same heel had crushed out his own life. Diana, goddess of chase, begged a place in the sky for Orion because he had been mightest of all huntsment. Juno jealously demanded a similar honor for her scorpion. Harrassed Jupiter had to place the two on opposite sides of the heavens so that they could harm each other no more.

(Continued on Page 8)

A MERCATOR PROJECTION OF THE STAR FIELD FOR 50 DEGREES NORTH AND 65 SOUTH OF THE EQUATOR

The Star Field makes an apparent complete revolution westward every 24 hours, hence the hourly division from I to XXIV, but this has no relation to the time that any portion of the map is in view

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THIS DATE BELOW EACH NUMERAL WILL SHOW WHEN THAT SECTION OF THE MAP WILL BE ON THE MERIDIAN—DUE SOUTH—AT 9 P. M. OR AN HOUR EARLIER FOR EACH NUMERAL WEST OF THIS DATE AND AN HOUR LATER FOR EACH NUMERAL EAST.

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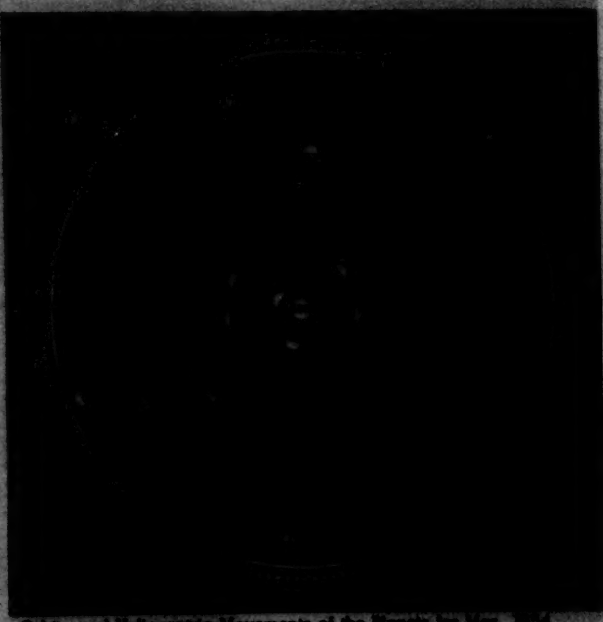

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A LETTER OF THANKS TO MY SUBSCRIBERS AND FRIENDS

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I also wish to thank Dr. Elliott Hochstein of 50 East 72nd Street, N. Y. C. who secured for me Dr. John Eckel of 862 Fifth Avenue, N. Y. C. the Surgeon whose hands were guided by the "GREAT SURGEON OF SURGEONS" thereby saving my life to be with you again this Christmas.

Sincerely yours,
MARIA BARRITT

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9 p. m.	21 h 00 m 00.0 s
Add zone time 75°/15	5 h 00 m 00.0 s
Greenwich or U. T.	26 h 00 m 00.00 s
or 1953, Apr 16th	02 h 00 m 00.0 s*
1953, Apr. 16th Sid T. Oh	13 h 35 m 21.8 s*
Conversion of mean to Sidereal time for 2 hrs.	19.7 s*
Sum of *'s	15 h 35 m 41.5 s
Subt. long NYC	4 h 56 m 00.0 s
Local Sid Time (NY)	10 39 m 41.5 s

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Local Sidereal Time which is required in the observatory can be computed from two formulas published in advertising in The Monthly Evening Sky Map and the Observer's Handbook or will be sent to any address upon request and with an example worked out for that location free of charge. Information in the method of using Sidereal Time will also be sent free.

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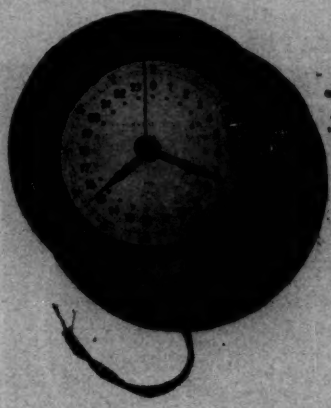

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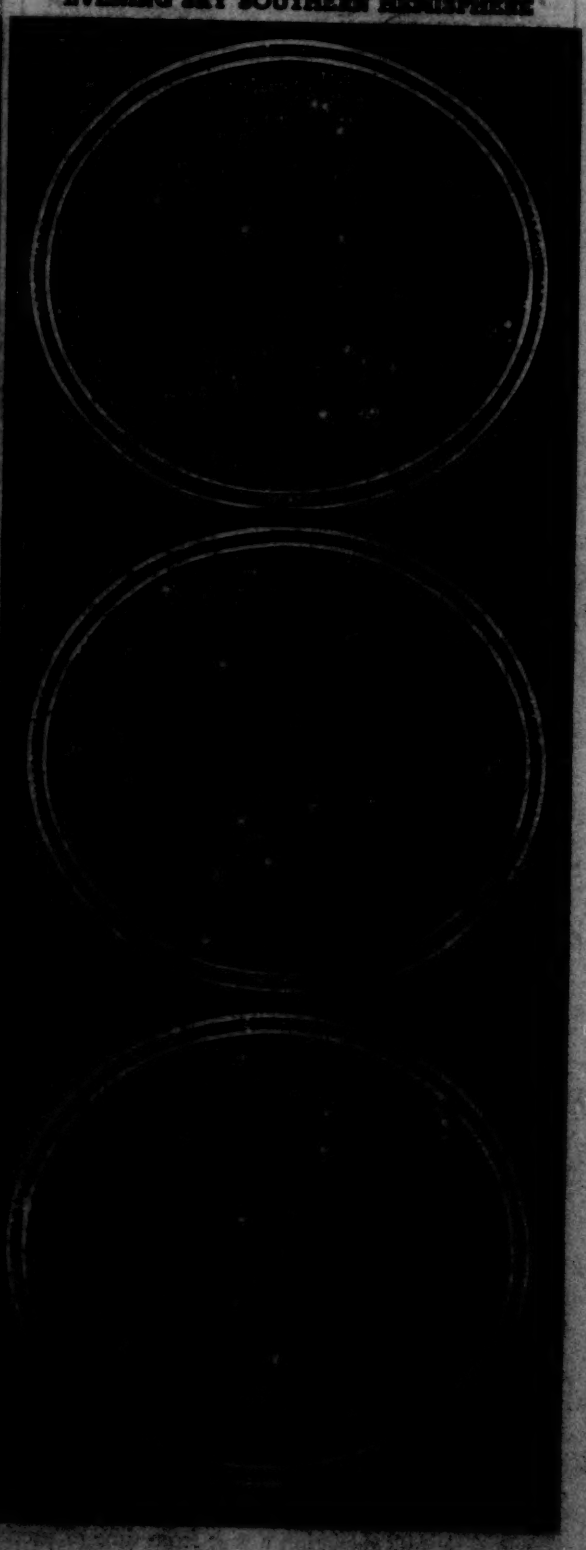

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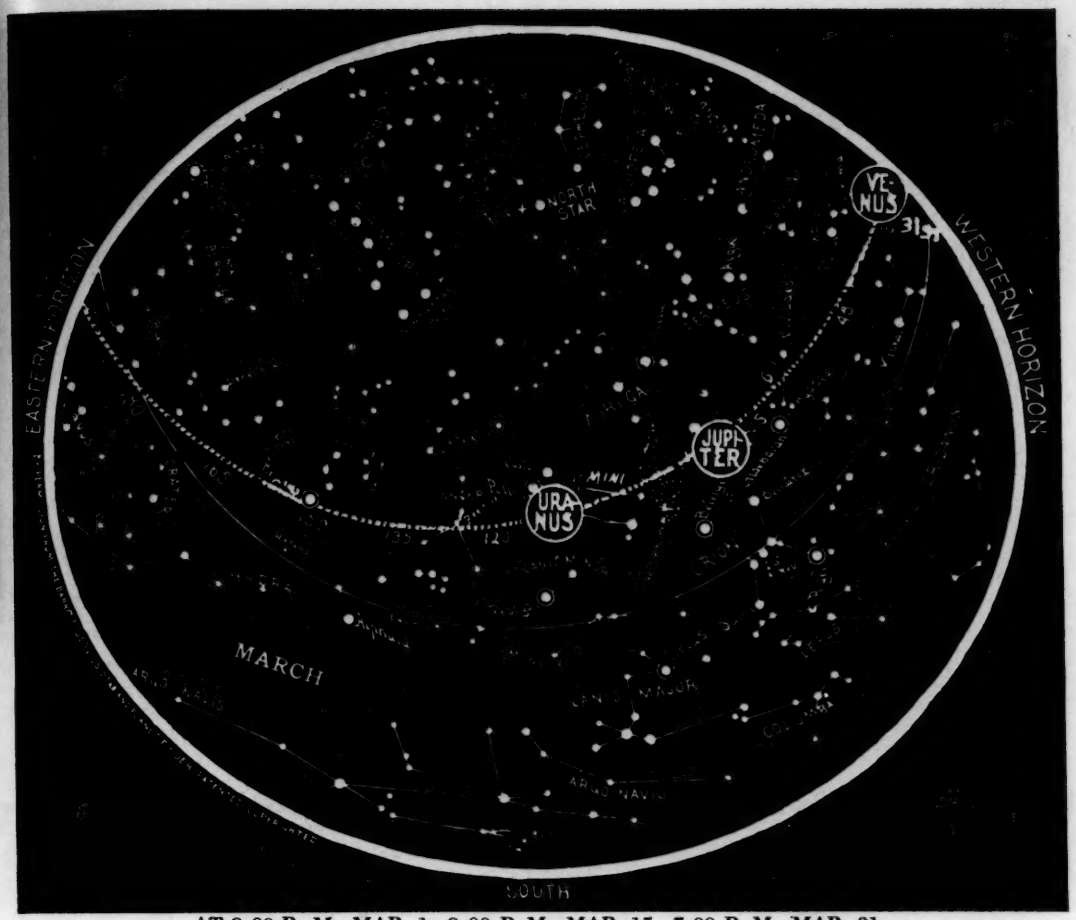

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THE HEAVENS WITHOUT A TELESCOPE
A Moving Picture of The Universe

THE ONLY COMBINATION SUN, MOON, STAR AND PLANET FINDER

The Chart is 15 x 15 inches square and has a revolving disk map showing all the stars visible to the naked eye in the Northern or Southern Hemisphere (be sure to mention which Hemisphere when ordering) and is practically useful anywhere in the United States or in corresponding Latitudes in Europe, or South America.

Price $7.00

CELESTIAL MAP PUBLISHING

Box 3, Pike County
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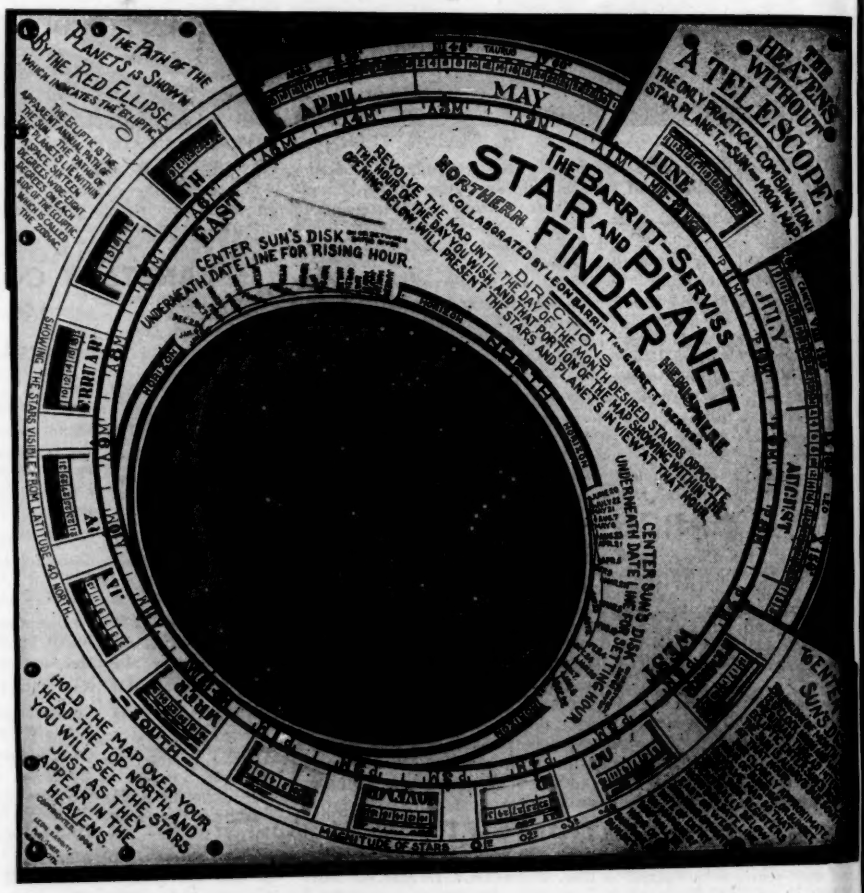
THE BARRITT-SERVISS STAR AND PLANET FINDER
COLLABORATED BY LEON BARRITT AND GARRETT P. SERVISS
NORTHERN HEMISPHERE
THE PATH OF THE PLANETS IS SHOWN BY THE RED ELLIPSE
THE HEAVENS WITHOUT A TELESCOPE
THE ONLY PRACTICAL COMBINATION STAR, PLANET, SUN AND MOON MAP
DIRECTIONS
REVOLVE THE MAP UNTIL THE DAY OF THE MONTH DESIRED STANDS OPPOSITE THE HOUR OF THE DAY YOU WISH AND THAT PORTION OF THE MAP SHOWN WITHIN THE OPENING BELOW, WILL PRESENT THE STARS AND PLANETS IN VIEW AT THAT HOUR.
CENTER SUN'S DISK UNDERNEATH DATE LINE FOR RISING HOUR.
CENTER SUN'S DISK UNDERNEATH DATE LINE FOR SETTING HOUR.
HOLD THE MAP OVER YOUR HEAD-THE TOP NORTH, AND YOU WILL SEE THE STARS JUST AS THEY APPEAR IN THE HEAVENS.
SHOWING THE STARS VISIBLE FROM LATITUDE 30° NORTH
MAY
JUNE
JULY
AUGUST
EAST
SOUTH
WEST

HAVE YOU SEEN THE NEAREST ★ STAR ★ IN THE NORTHERN HEMISPHERE 61 CYGNI?

It is on your meridian at 21 hours 5 minutes Sidereal Time, and 6½ degrees below Deneb which crossed 25 minutes before. It is 6th magnitude and beautiful double.

Your Sidereal Time is always the R. A. of your meridian, and when you know where that is your Sidereal Clock and Star List will give you the name of any star crossing it. You can pick out your meridian by checking the R. A. of a familiar star against the Sidereal Clock.

WHAT IS THE LOCAL SIDEREAL TIME?

At the Hayden Planetarium, New York, April 15th, at 9 P. M. E. S. T....

9 p. m.	21 h 00 m 00.0 s
Add zone time 75°/15	5 h 00 m 00.0 s
Greenwich or U. T.	26 h 00 m 00.00 s
or 1953, Apr 16th	02 h 00 m 00.0 s*
1953, Apr. 16th Sid T. Oh	13 h 35 m 21.8 s*
Conversion of mean to Sidereal time for 2 hrs.	19.7 s*
Sum of *'s	15 h 35 m 41.5 s
Subt. long NYC	4 h 56 m 00.0 s
Local Sid Time (NY)	10 39 m 41.5 s

The Sidereal Clock is a necessity for every observatory for checking the R. A. of the Stars.

For this purpose pendulum clocks must be very accurate with a rating of only a few seconds deviation in a month.

Special clocks are made for the electric power houses to keep control of the frequencies of the great electric generators supplying power to instruments of industry which require that frequencies must not vary beyond very specific tolerances.

The HAINES ELECTRIC SIDEREAL CLOCKS are made to accomodate those frequencies and by means of special gearing to convert from Standard Time to Sidereal Time, that is to say, from keeping the time of the Sun to keeping the time of the stars.

Astronomers have two sources of data from which to compute Local Sidereal Time, The American Ephemeris, published at Washington ($3.75) Superintendent of Documents and The Observer's Handbook a small volume published by the Royal Astronomical Society of Canada, 3 Willcocks St., Toronto 60 cents. Greenwich Sidereal Time in the Ephemeris pages 2 to 16 and in the Handbook on page 7.

Local Sidereal Time which is required in the observatory can be computed from two formulas published in advertising in The Monthly Evening Sky Map and the Observer's Handbook or will be sent to any address upon request and with an example worked out for that location free of charge. Information in the method of using Sidereal Time will also be sent free.

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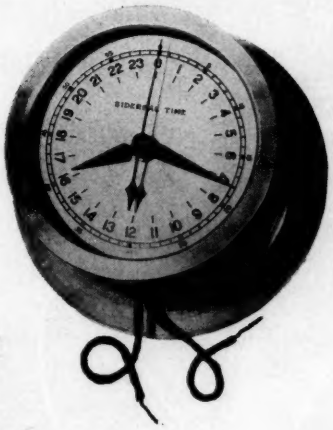

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Especially designed for Astronomers, and Observatories and has the numbers 0 to 23 or from 1 to 0—twenty four hours.

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The Monthly Evening Sky Map

MORNING SKIES FOR JAN-FEB.-MAR.

AT 5:00 A. M. JAN 1; 4:00 A. M. JAN 15; 3:00 A. M. JAN 31

AT 5:00 A. M. FEB 1; 4:00 A. M. FEB 15; 3:00 A. M. FEB 28

AT 5:15 A. M. MARCH 1; 4:15 A. M. MARCH 15; [illegible] A. M. MARCH 31

EVENING SKY SOUTHERN HEMISPHERE

AT [illegible] P.M. JAN 1; 8:45 P.M. JAN 15; 8 P.M. JAN 31

AT 9:15 P.M. FEB 1; 8:30 P.M. FEB 15; 7:45 P.M. FEB 28

AT 8:45 P.M. MAR 1; 7:45 P.M. MAR 15; 6:45 P.M. MAR 31